

The objective of the actions proposed in this report is to enhance steelhead utilization of Hilton Creek by removing impediments to upstream migration and improving spawning and rearing habitat. The benefits of the enhancement measures to steelhead and other species are discussed below.

4.1 BENEFITS TO STEELHEAD

The enhancement measures included in Hilton Creek would benefit steelhead in several ways. The supplemental watering system would increase the availability of rearing habitat during the summer-fall dry season. The proposed channel extension would utilize the supplemental watering system to create additional rearing habitat, and the fish passage improvement projects will allow steelhead access to upstream spawning and rearing habitat. A summary of the benefits is presented in Table 4-1.

The supplemental watering system combined with natural runoff will provide perennial instream flows which would directly benefit steelhead by improving the availability and quality of juvenile rearing habitat, particularly during late spring, summer, and fall. At the time of this report, this system is successfully being used to support approximately 450 young-of-the-year below the cascade. The supplemental watering system provides perennial flow to 2,980 feet of habitat below the upper release point and 1,380 feet of habitat below the lower release point. The supplemental water also benefits the habitat of additional fisheries in the lower Santa Ynez River downstream of Hilton Creek.

The proposed channel extension project would enhance the benefits of the supplemental water supply by creating approximately 1,215 feet of additional steelhead rearing habitat in Hilton Creek. Channel modifications in other river systems have resulted in highly variable success, depending on the design features and operation of the system. Therefore, further studies are required to determine the feasibility of this project in relation to such factors as seepage loss, water temperature, stream gradient, and predation.

The Hilton Creek fish passage improvement projects will improve fish passage through two identified migration impediments so that the steelhead can utilize upstream spawning and rearing habitat. The migration impediments consist of (1) a steep 6-foot cascade and 140-foot long confined bedrock chute located approximately 1,380 feet upstream of the confluence with the mainstem and (2) the Highway 154 Culvert. Providing passage through the cascade and bedrock chute will allow access to approximately 2,980 feet of stream channel up to the culvert at the Highway 154 Crossing, and providing access through the culvert will give access to several miles of upstream habitat.

Table 4-1 Amount of Habitat and Steelhead Lifestages Affected by Hilton Creek Enhancement Project

Project Element	Steelhead Lifestage Affected	Benefit	Amount of Habitat Affected
Supplemental Watering System	Fry, rearing juveniles, and over-summering adults	Maintain streamflow to support habitat through spring, summer, and fall.	1,380 feet to lower release 2,980 feet to upper release
Fish Passage Facilities	Migrating and spawning adults	Enhance access to spawning and rearing habitat above chute pool	2,800 feet between chute pool and Highway 154 Culvert and the upper reaches of Hilton Creek (3+ miles)
Channel Extension	Fry, rearing juveniles, possibly spawning adults	Create additional stream habitat for summer rearing and possibly spawning by extending lower channel	1,215 feet

Based on the information collected to date, impacts associated with these enhancement measures will be limited to construction related effects. The Adaptive Management Committee will work with NMFS and CDFG during the design phase of each project to minimize construction related impacts. Sediment management techniques will be employed as necessary and construction will occur in a dry channel when possible (e.g. the cascade/chute project, the channel extension). In addition, a number of minimization measures have been identified by NMFS for reducing construction related impacts on steelhead. These measures are summarized in Appendix C (Section 4, Implementation) and will be implemented for each project.

In conclusion, the proposed enhancement measures would produce an overall net environmental benefit to steelhead in Hilton Creek based upon field observations of spawning and juvenile rearing within Hilton Creek and operational experience with the temporary water delivery system. The modifications to Hilton Creek would directly increase available juvenile rearing and possibly spawning habitat within the Santa Ynez River system. Using the number of fish rescued from lower Hilton Creek in June 1998 (831 young-of-the-year over approximately 1,200 linear feet), the proposed project has the potential to produce up to approximately 2,850 young-of-the-year when winter flows are good (approximately 850 fish for Hilton Creek below the passage impediment, 1,000 fish between the bedrock chute and upper release site, and up to 1,000 fish in the channel extension minus the lowermost 100 to 250 feet of the existing Hilton

Creek). As part of the implementation plan, a monitoring program will evaluate habitat use, spawning success, and juvenile rearing of steelhead within Hilton Creek. The monitoring results will be used to document the expansion of available habitat through the fish passage structure and channel extension, and the incremental contribution of thermal warming from Hilton Creek to habitat conditions in the lower Santa Ynez River.

4.2 OTHER SPECIES

Native fish, especially the prickly sculpin which currently inhabits Hilton Creek, will likely benefit from the proposed actions. The watering system will provide a perennial water supply to the creek, and the proposed channel extension will create an additional 1,215 feet of predator-free habitat that will benefit sculpin. Construction of passage structures at the cascade/chute and Highway 154 Culvert are not likely to affect fish as construction will occur while the channel is dry, and because these fish will not migrate through the cascade/chute structure. Fish rescue activities may negatively affect fish present in Hilton Creek; however, measures taken to minimize the impact to steelhead should also minimize impacts on sculpin inhabiting the lower reach.

While many other sensitive species occur in the Santa Ynez River watershed, only the two-striped garter snake has been reported in the vicinity of Hilton Creek (Woodward-Clyde Consultants 1995, Reclamation 1998b). The snake has been observed immediately downstream of Bradbury Dam near the mouth of Hilton Creek. The proposed actions should benefit the snake by increasing the fish (prey) population in the stream and enhancing the riparian corridor along the creek.

Although red-legged frogs, southwestern willow flycatchers, and western pond turtles are not currently found in Hilton Creek, the proposed enhancement measures would create habitat which is more conducive for these species. The supplemental watering system would benefit the California red-legged frog, which requires perennial water, and the flycatcher and the pond turtle, which require water during the spring and fall. The watering system may also, however, provide habitat for bullfrogs which prey on red-legged frogs, so net benefits to this species are unknown.

- NMFS. 1998. Letter to the U. S. Bureau of Reclamation granting emergency authorization to rescue fish in Hilton Creek. June 23, 1998.
- NMFS. 2000. Biological Opinion. U.S. Bureau of Reclamation Operation and Maintenance of the Cachuma Project on the Santa Ynez River in Santa Barbara County, California. September 11, 2000.
- Santa Ynez River Technical Advisory Committee. 1996. Data Compilation Report: 1995. Prepared for the Santa Ynez River Consensus Committee, Santa Barbara, CA.
- Santa Ynez River Technical Advisory Committee (SYRTAC). 1997. Synthesis and Analysis of Information on the Fisheries Resources and Habitat Conditions of the Lower Santa Ynez River: 1993-1996. Prepared for the Santa Ynez River Consensus Committee, Santa Barbara, CA.
- SYRTAC. 1998. Data Compilation Report for 1996-1997. Prepared for the Santa Ynez River Consensus Committee, Santa Barbara, CA. Draft report.
- SYRTAC. 2000a. Unpublished Groundwater Elevation Data Collected between February 4, 1999 and July 6, 2000.
- SYRTAC. 2000b. March 6, 2000 Infiltration Study Results. March 10, 2000.
- SYRTAC. 2000c. Hilton Creek - Revised Fish Passage Project Design. May 3, 2000.
- SYRTAC. 2000d. Hilton Creek - Design of Fish Passage Improvement Structures. May 26, 2000.
- SYRTAC. 2000e. Data Compilation Report for 1998-1999. Prepared for the Santa Ynez River Consensus Committee, Santa Barbara, CA. Draft report.
- U.S. Bureau of Reclamation (Reclamation). 1998. Hilton Creek Fish Rescue Plan. June 3, 1998.
- U.S. Bureau of Reclamation (Reclamation). 1998b. Hilton Creek fish rescue assessment: draft report. Prepared for the National Marine Fisheries Service. August 9, 1998.
- Reclamation. 1998. Final Environmental Assessment and Finding of No Significant Impact: Safety of Dams Program Cachuma Project, California, Bradbury Dam – Spillway Modification Hilton Creek Water Supply Line. Prepared for the Bureau of Reclamation Mid-Pacific Region. October 22, 1998.
- Woodward-Clyde Consultants. 1995. Final Environmental Impact Report/Statement. Cachuma Project Contract Renewal: Volume I.

Engblom, S. 1999. Personal communications to R. Swenson (ENTRIX). SYRTAC Biologist.